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Original Article

Impact of kangaroo care on parental anxiety level and parenting skills for preterm infants in the neonatal intensive care unit

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KEYWORDS
Kangaroo care;
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Breastfeeding

Abstract *Objective:* To assess impact of kangaroo care (KC) on parental anxiety levels, breastfeeding rates and readiness at discharge.
Methods: Observational, prospective, pre-post interventional study. State–Trait Anxiety Inventory (STAI) surveys pre-post successful KC sessions and parental readiness survey were administered to eligible parents of preterm infants as well as breastfeeding data was collected.
Results: The mean change in pre- and post-KC STAI scores was significantly different for state anxiety (12.0 ± 10.9, $p < 0.0001$) and trait anxiety (5.8 ± 6.6, $p < 0.0001$) and correlated with parental age and income, but not sex, marital status, education or employment. 91% of parents performing KC vs 66% of parents NOT performing KC reported being very or extremely confident in caring for their infant at discharge. 81% of mothers initiated breastfeeding in NICU with 76% continuing at discharge.
Conclusions: KC is associated with a lower parental anxiety level, greater confidence in parenting skills and higher breastfeeding rates.

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Introduction

Becoming a parent, especially a first time parent, is a period of transition and anxiety, with close to 25% of mothers of healthy full-term newborns experiencing moderate pre-discharge anxiety after delivery as measured by validated anxiety inventories (Britton, 2005). With increases in the number of preterm births, advances in NICU technologies and improvements in survival of extremely low birth infants over the last few decades (Glass et al., 2015), the impact of having a sick preterm baby on the physical and emotional health of the care givers is enormous (Mew et al., 2003; Barnett et al., 1970; Leifer et al., 1972). The stress level varies with the medical condition of the infant, the family's support network and personal coping skills of the care givers. Furthermore, psychological distress, such as anxiety, felt by mothers of very low birth weight (VLBW) infants during NICU admission may persist for 2—3 years following birth (Ahlund et al., 2009). The effects of anxiety felt by mothers during NICU admission may also have lasting independent adverse impacts on child cognitive development at 24 months corrected gestational age (GA) (Zelkowitz et al., 2011).

Skin to skin care, commonly referred to as kangaroo care (KC), for the preterm infants has been shown to have a great impact on the infant's clinical status during the NICU stay. Infants are calmer, have longer sleeping times, have better growth trajectory and have more stable cardiorespiratory tracings during the periods of kangarooing (Messmer et al., 1997). Studies have also shown that infants receiving KC wean off of supplemental oxygen earlier with shorter lengths of NICU stay as compared to control infants (Gale and Vandenburg, 1998; Cleary et al., 1997). Beyond individual studies, a recent meta-analysis showed many benefits of KC including decreased mortality especially in VLBW infants, increased breastfeeding up to 4 months of age, reduced risk of newborn sepsis, hypothermia, hypoglycemia, hospital readmission and improved vital signs, head circumference growth and pain scores without any evidence of associated harm (Boundy et al., 2016). However, in preterm infants admitted to the NICU, the impact of KC on parental emotional wellbeing, ability to care for their infant at discharge and breast feeding duration are less clear.

In this study, our aim was to assess the impact of kangaroo care on the parental anxiety level, the level of parental confidence in participation of care for their preterm infants and success at breast feeding. We hypothesized that KC will decrease parental anxiety level during NICU admission, improve parental readiness at discharge and increase success at breast feeding.

Methods

This was an observational, prospective, pre—post intervention cohort study including parents, both mother as well as father, of infants $\leq$34 weeks completed GA and/or $\leq$2500 g birth weight (BW) who were admitted to Baystate Children's Hospital, a level III NICU during the study period of March 2012 to December 2013. The study was approved by the Institutional Review Board and a written informed consent was obtained from the parents prior to any study intervention. We excluded parents of infants who were critically ill and not expected to survive to discharge. Once enrolled, study participants completed State—Trait Anxiety Inventory (STAI) for Adults self-administered questionnaire prior to initiation of kangaroo care (pre-intervention period). Kangaroo care was then initiated as per the NICU KC guidelines. Following the intervention phase (i.e., at least 2 successful KC encounters lasting minimum of 30 min), the STAI was repeated (post-intervention period). The STAI for Adults is a validated tool to assess for both state and trait anxiety, has a high test and reliability correlation, with α coefficient of 0.92 and 0.90 for state and trait anxiety, respectively, and is widely used in research studies (Spielberger et al., 1983). This inventory, selected because of its reliability and extensive use, consists of 40 self-reported statements that divide anxiety into two components: (1) trait anxiety, a measure of dispositional (baseline) level and proneness to anxiety, and (2) state anxiety, a transient measure of acute responses to situations (Spielberger et al., 1983). Changes in the STAI score over the two time periods were compared. To assess parental readiness at discharge a single question about comfort level at discharge was asked on a 5-point Likert scale and correlated with the number of KC events during the NICU stay.

Survey variables

The data collected included baseline demographic information on the parental age, gender, occupation, marital status, socioeconomic status, level of education, gestational age of the infant, previous NICU experience, family support member availability, history of pre-existing depression or

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